

# Meridian ISC, Model M4xx/5xx

DSP-Based Integrated Servo Controllers

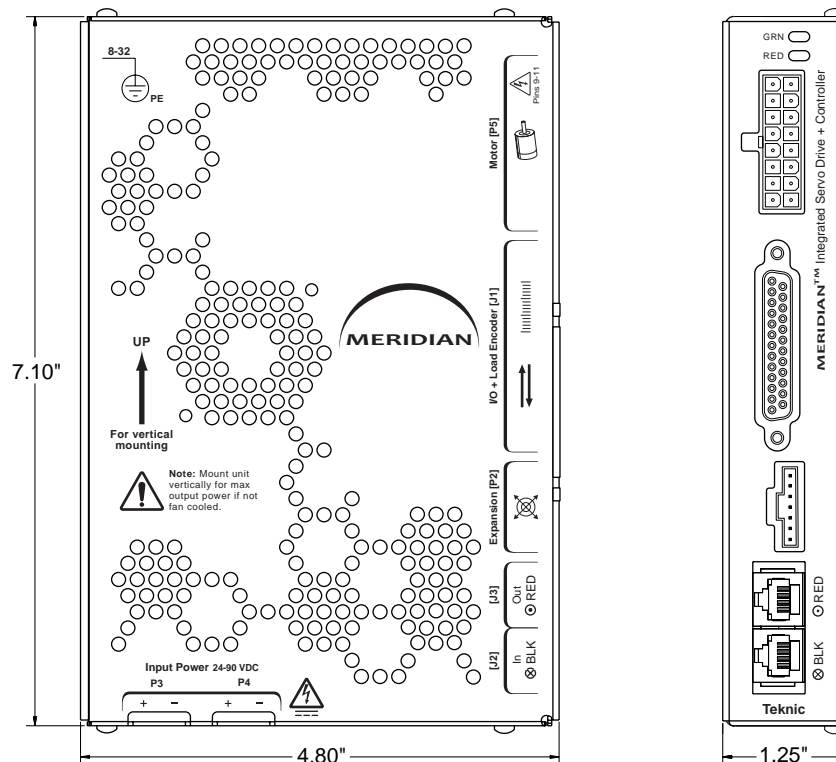


## FEATURES

- Advanced trajectory generation includes multi-speed moves with head and tail ramps, asymmetric accel/decel, etc. with smooth jerk and higher order derivative energy limiting.
- Exceptional servo control, includes: advanced estimators, electronic inertia matching and smooth operating multi-state feed-forward terms.
- Integrated I/O control for high-speed response to input events and high-speed output control based on internal events.
- Built-in user-programmable logic structure allows easy deterministic coordination of internal and external events, I/O and encoder capture/compare.
- g-Stop™ command tuning cures resonant vibration problems with negligible effects on throughput.
- I/O expansion up to 36 inputs/34 outputs (M5xx) up to 12 inputs/10 outputs (M4xx) using IEX bus.
- System-wide E-stop function smoothes safety integration.
- Universal motor interface drives brush, 3-phase brushless, 2-phase brushless, stepper motors, voice-coils, etc.
- Closed loop vector drive of stepper motors enables reduced cost—yet high-torque—direct-drive applications.
- Full galvanic isolation between communication, I/O signals and servo power/phases minimizes noise problems and speeds electrical and safety integration.
- Digital filtering of input and feedback signals provides high immunity to electrical noise while warning of noisy conditions.
- Daisy chained DC power connectors and internal protection reduces power distribution requirements.

## MODEL LIST

Model	Peak Current [A]	RMS Current [ARMS]	Bus Voltage [VDC]
ISC-M423-KCx	20	6	24-90
ISC-M493-KCx	23	7	24-90
ISC-M523-RCx	28	8	24-90
ISC-M543-RCx	33	12	24-90

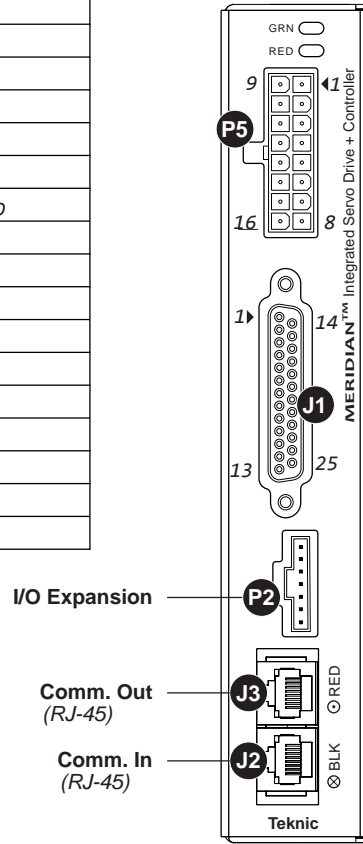


## SPECIFICATIONS

GENERAL	Dimensions, in (mm):	7.10 (180) x 4.80 (123) x 1.25 (32)
	Weight, oz (g):	17 (494)
ENVIRONMENTAL	Operating Temperature:	0-40°C
	Humidity:	0-90%, non-condensing
COMPLIANCE	Electrical safety:	EN61010, UL508C
	EMI:	EN 61326
	Machine safety:	EN 954-1, with proper power control
OUTPUT POWER	PWM ripple frequency:	28kHz, center balance vector type
	Conversion efficiency:	>99%
COMPENSATOR	TSPD:	35µS
	Position/velocity control:	Enhanced PIV with proprietary velocity, acceleration and jerk estimators, Inertia Matching Technology (IMT), g-Stop™ Command Tuning, and Anti-Hunt. Provides velocity, acceleration, jerk and friction feed-forward gains.
	Torque control:	Synchronous vector with DQ decoupling, SmartSaturation, and auto calibration
ENCODER	Primary (Motor) Interface:	Single-ended or differential (user-selectable)
	Secondary (Load) Interface:	Differential
	Max count rate:	24 MHz, quadrature, count rate
	Features:	Bad sequence detection, digital filtering adjustable from 100kHz to 40MHz
MOTOR COMPATIBILITY	Requirements:	Rotary brush, 3-phase brushless, 2-phase brushless, stepper motors, voice-coils, etc.
LIMIT INPUTS	Interface:	TTL with 2kΩ pull-up, digitally filtered
HALL SENSOR INPUTS	Specifications:	5kΩ pull-up to +5VDC
	Features:	Digitally filtered, used to set torque/force vector on initialization (drive may also operate in sensorless mode)
GENERAL PURPOSE INPUTS	Interface:	Two (2) high speed uncommitted 2-pin opto-isolator inputs similar to a solid state relay. GPI-0 can initiate capture of the motor or load encoder position to the count. 4-24V input range.
GENERAL PURPOSE OUTPUTS	Interface:	Two (2) high-current, high speed, opto isolated transistor outputs with active clamping and short circuit & over current protection. Will directly drive 24V inductive loads. Outputs can be triggered under host program control, from encoder counter compare or via user-definable logic functions.
	Output Ratings:	GPO-0: 625mA (15W @ 24V); GPO-1: 208mA (5W @ 24V).
REAL-TIME MONITOR PORT	Features:	Configurable filtering, sync pulse, scaling/zoom, non-volatile
	Output variables:	Position error, actual velocity, commanded velocity, velocity error, commanded torque/force, actual torque/force, SGN velocity, SGN position, measured position, commanded jerk, commanded acceleration, max phase voltage
PROTECTION AND SAFETY FUNCTIONS	Drive protection:	Short circuit (phase-to-phase, phase-to-ground), over-temperature, over voltage, over current, protected for open windings, fused
	Motor protection:	True RMS torque/force limiting, automatic speed-limit, motor jam detection, over temperature
	Mechanical safeguards:	Hardstop detection, limit switch servoing, adjustable tracking error limit and shutdown thresholds, adjustable torque/force limits, adjustable speed limits
	Electrical isolation:	1.0 mm
INPUT SUPPLY	Input voltage:	24-90 VDC
	Input current:	Up to 6.75A RMS, 15A peak (application dependant)
COUNTRY OF ORIGIN	Manufactured in:	USA
WARRANTY	Duration:	3-year standard, 5-year optional

## CONNECTOR DETAIL

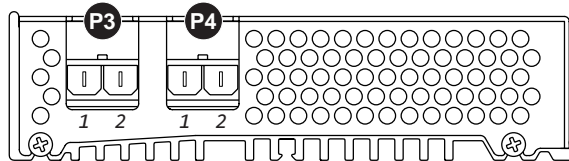
P5-Motor Connector	
PIN#	DESCRIPTION
1	MOTOR PHASE SHIELD
2	NO CONNECT
3	COMM. S-T
4	COMM. R-S
5	COMM. T-R
6	ENCODER/HALL SHIELD
7	ENCODER/HALL GND
8	ENCODER A~
9	MOTOR PHASE R
10	MOTOR PHASE S
11	MOTOR PHASE T
12	+5V OUT
13	ENCODER I
14	ENCODER B
15	ENCODER A
16	ENCODER B~



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J1-Controller Connector	
PIN#	DESCRIPTION
1	CHASSIS
2	LOAD ENCODER A (IN)
3	LOAD ENCODER B (IN)
4	LOAD ENCODER I (IN)
5	GPI-2/+LIMIT
6	+5V OUT
7	+5V OUT
8	+5V OUT
9	+5V OUT (ENCODER)
10	GPI-0
11	GPI-1
12	Vo+
13	Vo+
14	LOAD ENCODER A~ (IN)
15	LOAD ENCODER B~ (IN)
16	LOAD ENCODER I~ (IN)
17	GPI-3/-LIMIT
18	GND
19	GND
20	GND (ENCODER)
21	GPI-0 RETURN
22	GPI-1 RETURN
23	Vo-
24	GPO-1
25	GPO-0/BRAKE

P3,P4-Power Connector	
PIN#	DESCRIPTION
1	24-90VDC (V+)
2	24-90VDC (V-)



Meridian ISC-M4xx/5xx end-on view